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10/007,082	12/06/2001	Linden Minnick	42390P12249	3183

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EXAMINER

MADAMBA, GLENFORD J

ART UNIT	PAPER NUMBER
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2151

DATE MAILED: 03/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/007,082

Applicant(s)

MINNICK ET AL.

Examiner

Glenford Madamba

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 06 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 11 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Johnson, U.S. Patent 5,905,874.
3. Claim 1 discloses an apparatus comprising: an input/output (I/O) device 210 [Figure 2 and 3]; said I/O device being operative to receive a fragment of electronic data [Col 2, Lines 27-42], and further being operative to identify at least a portion of the contents of said fragment of electronic data [Col 3, Lines 33-41 & Col 4, Lines 13-22], and further being operative to moderate one or more interrupts of an associated computing platform processor, based at least in part on the at least a portion of said contents [Col 2, Lines 48-51].

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Claims 11 and 20 state the same limitations as Claim 1 above, and are rejected for the same reasons as they differ only by their statutory category.

4. Claim 3 recites the apparatus of claim 1, wherein said I/O device comprises a network interface card (NIC) **210** [Col 2, lines 13-26; Col 3, lines 15-32; Figure 2 and 3].

5. Claim 5 stipulates the apparatus of claim 1, wherein said I/O device is configured to moderate by substantially immediately asserting said one or more interrupts of said associated computing platform processor [Col 2, lines 48-51 & Col 7, lines 52-56].

Claims 14 and 23 state the same limitations as Claim 2 above, and are rejected for the same reasons as they differ only by their statutory category.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2, 4, 12, 13, 21, 22 are rejected under 35 U.S.C 103(a) as being unpatentable over Drott et al (hereinafter Drott), Patent Number 6,333,929.

3. Claim 2 asserts the apparatus of claim 1, wherein the at least a portion of said contents comprises an acknowledgement (ACK).

Johnson teaches in his invention that data is typically transferred across network segments in the form of packets or frames. Further, the data transferred and written into the buffer of an I/O device, such as a network interface device (NIC), are written in blocks of data that are in the form of packets or portions of packets (fragments) [Col 2, Lines 27-42]. Johnson does not disclose that the portion of said contents of said fragment of data specifically comprises an acknowledgement (ACK).

Drottar, in his invention for formatting and transmitting network packets over a distributed computer system, discloses a packet format that includes a transaction header **640** and a media access control (MAC) header **650** [Col 3, lines 6-9; also Col 11, lines 16-19; Figure 6]. As can be seen in the format for data packets with a MAC header, the header format includes a field for an ACK/NAK identification and processing [Col 13, lines 1-7; also see Col 10, lines 59-67].

It would therefore be obvious to one ordinarily skilled in the art at the time of the invention to include the packet formatting features employed by Drottar's invention into Johnson's to improve packet switching speed and processing efficiency in the transmission of data [Col 16, lines 1-12].

Claims 12 and 21 state the same limitations as Claim 2 above, and are rejected for the same reasons as they differ only by their statutory category.

4. Claim 4 maintains the apparatus of claim 1, wherein at least a portion of said contents comprises a priority designation [Drottar, Col 2, lines 31-33; also Col 16, lines 1-12 & 25-39].

Claims 13 and 22 state the same limitations as Claim 4 above, and are rejected for the same reasons as they differ only by their statutory category.

5. Claims 6-10, 15-19, 24-28 are rejected under 35 U.S.C 103(a) as being unpatentable over Gentry Jr., Patent Number 6,434,651.

6. Claim 6 points to the apparatus of claim 1, wherein said I/O device is configured to moderate by deferring said one or more interrupts of said associated computing platform processor so that a predetermined number of interrupts per unit of time is not exceeded.

For his invention, Johnson discloses a computer system that includes a host processor, memory, an interface bus and a network interface device (NIC) for

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communicating with a network [Col 3, lines 16-20]. The NIC informs the host processor that a block of data was received and that a DMA transfer of data has been performed into the computer memory, via an interrupt [Col 2, Lines 40-51]. Johnson does not disclose that the network interface device is configured to moderate by deferring one or more interrupts of the host processor so that a predetermined number of interrupts per unit of time is not exceeded.

Gentry, Jr., in his invention for modulating or suppressing the issuance of interrupts from a communication device such as a NIC [Col 1, lines 6-10], discloses an apparatus whereby interrupts normally generated when packets are received by a NIC and transferred to a host processor are alternately enabled and disabled. In particular, after one interrupt is issued to and serviced by a host processor, another interrupt is not generated until a *predetermined period of time* has passed for a specified amount of network traffic has been sent to the host computer system. [Gentry Jr., Col 7, lines 37-47 & 51-56; also Col 8, lines 1-11 & 39-67]

It would therefore be obvious to one ordinarily skilled in the art at the time of the invention to incorporate the interrupt suppression features in Gentry Jr.'s invention into Johnson's so that a host processor can be more responsive to other tasks (e.g. user activity) and to decrease the amount of processor time used to process network traffic, by modulating the number of network interrupts generated by a network interface device [Gentry Jr., Col 7, lines 29-36].

7. Claim 7 states the apparatus of claim 1, wherein said I/O device is configured to moderate by deferring said one or more interrupts until a particular number of fragments of electronic data of a particular type are received by said I/O device [Gentry Jr., Col 7, lines 19-36, 47-56, & 63-67; Col 8, lines 1-11 and 39-67].

Claims 16 and 25 state the same limitations as Claim 1 above, and are rejected for the same reasons as they differ only by their statutory category.

8. Claim 8 cites the apparatus of claim 1, wherein said I/O device is configured to moderate by deferring said one or more interrupts until a particular quantity of electronic data is received [Gentry Jr., Col 7, lines 47-56, & 63-67; Col 8, lines 1-11].

Claims 17 and 26 state the same limitations as Claim 1 above, and are rejected for the same reasons as they differ only by their statutory category.

9. Claim 9 states the apparatus of claim 1, wherein said moderation of associated computing platform interrupt scheme is configurable through a user interface [Gentry Jr., Col 7, lines 51-56; Col 8, lines 3-11].

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Claims 18 and 27 state the same limitations as Claim 1 above, and are rejected for the same reasons as they differ only by their statutory category.

10. Claim 10 identifies the apparatus of claim 1, and further comprising: said I/O device further being operative to measure a particular period of time after the receipt of a fragment of electronic data, and further being operative to moderate one or more interrupts of an associated computing platform after said particular period of time has elapsed [Gentry Jr., Col 7, lines 37-47 & 51-56; also Col 8, lines 39-67].

Claims 19 and 28 state the same limitations as Claim 1 above, and are rejected for the same reasons as they differ only by their statutory category.

11. Claim 15 identifies the method of claim 11, wherein said moderating comprises deferring said one or more interrupts of said associated computing platform processor if a predetermined number of interrupts per unit time is met or exceeded [Gentry Jr., Col 7, lines 37-47 & 51-56; also Col 8, lines 39-67].

12. Claim 24 states the article of claim 20, wherein said moderating comprises deferring said interrupting of said associated computing platform processor [Gentry Jr., Col 1, Lines 5-10; Figure 1; also Col 7, lines 10-18].

Conclusion

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Klein et al, Patent No. 5943479, discloses a method to reduce the rate of interrupts by the central processing unit (CPU) without any loss of interrupts, through the use of two parameters. The first parameter sets the event threshold, which is the maximum value of consecutive events allowed to occur, for example, the maximum number of received data packets before an interrupt is posted to the CPU. The second parameter sets the event time-out, which is the maximum time an event can be pending before posting an interrupt to the CPU.

Gentry et al., Patent No. 5659758, describes an apparatus for modulating the rate of packet arrival interrupts to avoid burdening the processor with excessive interrupts during receipt of a burst of network data. Preferably both the period of time and the number of packets required for a packet arrival to generate an interrupt are programmable.

Stevens, Patent No. 6338111, describes an invention that reduces the number of data I/O interrupts in a computer, based on dynamic communication between an I/O adapter and a host.

Burns et al, Patent No. 6345301, describes an invention that implements a distributed TCP/IP network communication protocol stack, with the protocol stack including a TCP layer and an IP layer. The invention discloses the use of SYNs and ACKs to establish/ initiate a normal network connection and is included as part of a data packet.

Reid et al, Patent No. 6115776, describes an invention that generates interrupts to a host system when data is received from the network or downloaded from system memory for transmittal over the network. The adaptor generates interrupts after a delay determined by an interrupt deferral mechanism.

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenford Madamba whose telephone number is 571-272-7989. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zarni Maung can be reached on 571-272-3932. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Glenford Madamba
Examiner
Art Unit 2151


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